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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/520,798  | 08/10/2005  | Lin Xiang Sun        | 0299568-0420-PCT-US | 9959             |
| 22469 7590 08/12/2009<br>SCHNADER HARRISON SEGAL & LEWIS, LLP<br>1600 MARKET STREET<br>SUITE 3600<br>PHILADELPHIA, PA 19103 |             |                      |                     |                  |
| EXAMINER<br>SCHEUERMANN, DAVID W  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 2834  |             |                      |                     |                  |
| MAIL DATE   |             | DELIVERY MODE        |                     |                  |
| 08/12/2009  |             | PAPER                |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/520,798

**Applicant(s)**

SUN ET AL.

**Examiner**

DAVID W. SCHEUERMANN

**Art Unit**

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**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 4-7, 10, 21 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-9, 11-12, 15-20, 22, 23 and 28-30 and 33 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 31 and 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/6/2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) see 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: IDS 6/09/2009 and 6/15/2009.

## **DETAILED ACTION**

### ***RCE***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/4/2009 has been entered.

### ***Response to Arguments***

Applicant's arguments filed 10/6/2008 have been fully considered but they are not persuasive, except as regards claims 13, 14, 31 and 32. Claim 21 has been withdrawn because it depends on withdrawn claim 25. Applicant's claim reads: " ... force between said rotor and said stator that opposes an external force *F*<sub>ext</sub>, said compensation force being either attractive or repulsive depending on said external force *F*<sub>ext</sub>.", emphasis added. Applicant argues that the reference is not proper because the force can be both attractive and repulsive, and cites an example of the text in the reference where this is indeed the case, see the penultimate paragraph on page 9 of applicants remarks filed on 2/4/2009. The Examiner disagrees with this argument, because the claim as written

does not preclude the possibility of the device having both repulsive and attractive forces. In response to Applicant's argument that Imlach, US 5894181 includes additional structure not required by Applicant's invention, it must be noted that Imlach, US 5894181 discloses the invention as claimed. The fact that it discloses additional structure not claimed is irrelevant.

As to Tanaka et al., JP 404078315A, note the rejection below with new reference numerals cited. Furthermore, note that during normal operation, absent a large external vibration or shock, the rotor and magnetic thrust bearing S do not touch and a gap either A or B is maintained, hence the claim limitations are met.

As to ONO ET AL., US 5360470, note the rejection includes a clear statement as to how the references can be combined.

As to claim 11, the examiner is not persuaded by applicant's argument because case law has established that to select a known material on the basis of its suitability for the intended use is a matter of obvious design choice. In other words, since the materials, i.e., carbon steel and mild steel are already known for use in a rotor and stator, respectively, these limitations cannot be the basis for patentability since the suitability of the materials is already known in the prior art. Thus this rejection is maintained.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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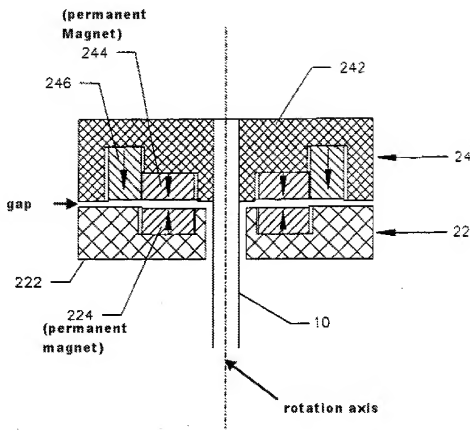
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 12, 16-18, 20, 22 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Imlach, US 5894181. Imlach, US 5894181 shows:

A thrust load enhancement device for a rotor-bearing system, comprising  
a stator 22 mounted on a rotation axis of the rotor-bearing system;  
a rotor 24 mounted on the rotation axis of the rotor-bearing system and  
separated from said stator by a magnetic air gap on the rotation axis; and  
at least one permanent magnet 244 mounted on the rotation axis of the  
rotor bearing system ( see figure 2a labeled below)

wherein said at least one permanent magnet is fixed to a first one of : i)  
said stator and ii) said rotor, and is separated from a second one of : i) said stator  
and ii) said rotor by said magnetic air gap; said at least one permanent magnet,  
said stator, said rotor and said magnetic air gap forming a magnetic circuit  
generating a compensation force between said rotor and said stator that opposes  
an external force  $F_{ext}$ , said compensation force being either attractive or  
repulsive depending on said external force  $F_{ext}$ . (inherent since the gap remain  
substantially constant)



Re claim 2, note that shaft 10 of Imlach, US 5894181 is disposed in a vertical orientation therefor the effects of gravitational force is balanced.

Re claims 3 and 22, note permanent magnet 224, supra.

Claims 12, 16, 17, 18 and 30 recite are limitations related to intended use of the device with no additional structural apparatus limitations or characterizations recited of the device itself. Furthermore, Imlach, US 5894181 shows the rotor being supported in a vertical orientations thus acting against shaft weight.

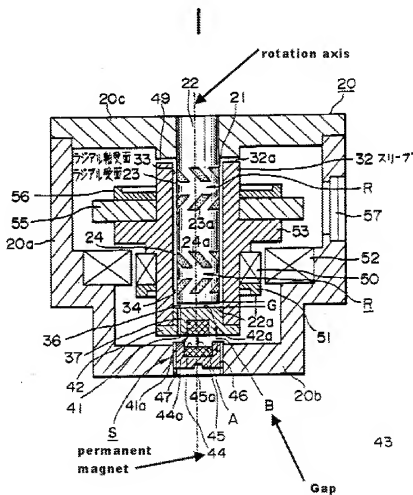
Claims 1, 20 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al., JP 404078315A. Tanaka et al., JP 404078315A shows:

A thrust load enhancement device for a rotor-bearing system, comprising  
a stator ( thrust magnetic bearing S, see page 8 of translation) mounted  
on a rotation axis of the rotor-bearing system;  
a rotor (42A coupled to rotating sleeve 32, see figure 1 below) mounted  
on the rotation axis of the rotor-bearing system and separated from said stator by  
a magnetic air gap (either A or B, see page 9 of translation) on the rotation axis;  
and  
at least one permanent magnet (41 or 44, see page 8 of translation)  
mounted on the rotation axis of the rotor bearing system ( see figure 1 labeled  
below)

wherein said at least one permanent magnet is fixed to a first one of : i) said  
stator and ii) said rotor, and is separated from a second one of : i) said stator and  
ii) said rotor by said magnetic air gap (either A or B, see page 9 of translation);  
said at least one permanent magnet (41 or 44, see page 8 of translation), said  
stator, said rotor and said magnetic air gap forming a magnetic circuit generating  
a compensation force between said rotor and said stator that opposes an  
external force  $F_{ext}$ , said compensation force being either attractive or repulsive  
depending on said external force  $F_{ext}$ . (inherent since the gap remain  
substantially constant, except for large external vibration or shock as pointed out

by applicant on page 11 of the response of 2/4/2009, however during normal operation this feature is present in the device of Tanaka et al., JP 404078315A)

Re claim 33, note hydrodynamic bearing system comprising 23a and 24a.





***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 9, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of ONO ET AL., US 5360470. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. Imlach, US 5894181 does not expressly disclose, "...further comprising a spacer to adjust said first and second magnetic air gaps." or "... further comprising a piezoelectric actuator mounted in said stator." ONO ET AL., US 5360470 discloses use of a piezoelectric spacer 70p, for the purpose of adjusting the magnetic gap of a magnetic bearing to ensure efficient operation. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include an adjustable piezoelectric spacer to moveably support any of the magnets of the device of Imlach, US 5894181 as taught by ONO ET AL., US 5360470. One of ordinary skill in the art would have been motivated to do this to maintain the efficient operation of the device.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of GUY, CN 1120256A and THOMAS, US 2782354. Imlach, US

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5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, *supra*. Imlach, US 5894181 does not expressly disclose, "...wherein said rotor is made of carbon steel and said stator is made of mild steel." GUY, CN 1120256A and THOMAS, US 2782354 disclose, respectively the use of a rotor made of carbon steel to reduce costs and use of a mild steel stator to avoid flux crossing laminations see column 2, lines 9-14. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a suitable and desired material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In Re Leshin*, 125 USPQ 416. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a rotor of carbon steel and a stator of mild steel in the device of Imlach, US 5894181. One of ordinary skill in the art would have been motivated to do this to reduce manufacturing costs and reduce reluctance in the magnetic path. In other words, since the materials, i.e., carbon steel and mild steel are already known for use in a rotor and stator, respectively, these limitations form the basis for patentability since the suitability of the materials is already known in the prior art.

#### ***Allowable Subject Matter***

Claims 13, 14, 31, 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The limitations of, "...further comprising force measurement devices to measure the compensation force." in combination with the remaining claimed structure is neither found nor fairly suggested in the prior art or any combination thereof as re claims 13 and 14.

The following is a statement of reasons for the indication of allowable subject matter: The limitations of, "...further comprising the step of providing force measurement devices to measure the compensation force." in combination with the remaining claimed method is neither found nor fairly suggested in the prior art or any combination thereof as re claims 31 and 32.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID W. SCHEUERMANN whose telephone number is (571)272-2035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached at (571) 272-8188. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Quyen Leung/  
Supervisory Patent Examiner, Art Unit 2834

/David W. Scheuermann/  
Examiner, Art Unit 2834  
8/12/2009